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TRANSACTIONS

OF THE

London Natural History Society

For the Year 1918.

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PUBLISHED BY THE
LONDON NATURAL HISTORY SOCIETY,
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1919

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1919.

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LIST OF MEMBERS.

It is particularly requested that Members will inform the Secretaries as soon as possible of any change of address.

HONORARY MEMBERS.

Grant, G. F., Beaumont Manor, Wormley, Broxbourne, Herts.
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Austin, S., 43, Darenth Road, Stamford Hill, N. 16. (Orn., Arch.)
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Blum, Victor, 23, Valentine's Road, Ilford. (Lep.)
Bowles, E. A., M.A., F.L.S., F.E.S., Myddelton House, Waltham Cross, Herts. (Bot., Zool., Lep., Orn.)
Bowman, R. T., 68, Mornington Road, Chingford, E. 4. (Lep.)
Bradley, S. W., 12, Glebeland Avenue, South Woodford, E. 18.
Braithwaite, J. O., 18, Warren Road, Chingford, E. 4. (Micr., Bot., Ent.)
Braithwaite, Miss N. A., 18, Warren Road, Chingford, E. 4.
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Capleton, A., 67, Queens Road, Leytonstone, E. 11.
Capleton, J. H., 75, Queen's Road, Leytonstone, E. 11.
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Cooper, B., 103, Bethune Road, Stoke Newington, N. 16 (Lep., Bot.)
Cox, Oswald F., "Croftdown," Shepherd's Hill, Highgate, N. 6. (Bot.)
Crabtree, B. H., F.E.S., "Hollybank," Alderley Edge, Cheshire. (Lep.)
Cross, F. B., Park Villa, 65, Bruce Grove, Tottenham, N. 17. (Lep.)

Cyriax, R. C., 23, Aberdare Gardens, West Hampstead, N.W. 6. (Arch., Aryan question, Indo-European languages.)
Dadd, E. M., F.E.S., Puppelstr., Zehlendorf bei Berlin. (Lep.)
Dell, F. G., "The Hut," Russell Road, Buckhurst Hill, Essex. (Pond life.)
Dewhurst, Rev. H., M.A., St. Andrew's Vicarage, Leytonstone, E. 11.
Dewhurst, Mrs., St. Andrew's Vicarage, Leytonstone, E. 11.
Digby, D. E., "Keneric," Monkhams Avenue, Woodford Green. (Bot.)
Digby, Howard, "Keneric," Monkhams Avenue, Woodford Green. (Geol.)
Dodd, W. R., Burton Grange, Cheshunt, Waltham Cross. (Lep.)
Douglas, J., "Thorncote," Chellaston, Derby. (Lep.)
Edelsten, H. M., F.E.S., "The Elms," Forty Hill, Enfield. (Lep.)
Evans, R. G., 5, Dean Road, Cricklewood, N.W. 2.
Eynon, Lewis, B.Sc., F.I.C., 41, Champion Road, Upminster, Essex.
Fleming, John, 180, Bishopsgate, E.C. 2. (Lep.)
Gardner, J. E., 204, Evering Road, Upper Clapton, E. 5. (Lep., Bot.)
Gaze, W. E., 10, The Avenue, Highams Park, Chingford, E. 4. (Lep., Bot., Chem.)
Gerrard, V., 10-11, Mincing Lane, E.C. 3. (Lep.)
Glegg, W. E., Brewery House, Stamford Hill Brewery, N. 16. (Orn.)
Greengrass, Miss Madeleine, "Elmfield," 51, The Ridgeway, Chingford, E. 4.
Greenwood, M., jun., L.R.C.P., M.R.C.S., "Hillcrest," Church Hill, Loughton, Essex. (Arch., Biol.)
Gwatkin-Williams, Captain R. S., R.N., 70, Lissenden Mansions, Highgate Road, N.W. 5. (Lep.)
Hall, L. B., F.L.S., 28, Station Road, Winchmore Hill, N. 21. (Bot., Galls., Biol.)
Hanbury, Frederick J., F.L.S., F.E.S., Brocklurst, East Grinstead. (Bot. Lep.)
Hanbury, F. Capel, 37, Lombard Street, E.C. 3. (Lep.)
Hanson, P. J., "Burcroft," Village Road, Bush Hill Park, Enfield. (Orn. Arch.)
Hanson, Mrs., "Burcroft," Village Road, Bush Hill Park, Enfield.
Harvey, F. B., "The Nook," Rhodes Minnis, Elham, Canterbury. (Lep.)
Hayward, H. C., The Croft, Repton, Derby (Lep.)
Heath, G. H., M.A., 277, Brockley Road, S.E. 4. (Lep.)
Hodge, A. E., 14, Astonville Street, Southfields, S.W. 18. (Lep.)
Howard, D. Lloyd, J.P., F.I.C., F.C.S., Little Friday Hill, Chingford, E. 4.
Jackson, F. W. J., Woodcote End House, Epsom. (Lep.)
James, Russell E., "Brockenhurst," Bloomfield Road, Highgate, N. 6. (Lep.)
*Kaye, W. J., F.E.S., "Caracas," Ditton Hill, Surbiton, Surrey. (Lep.)
Kind, H. A., 63, Empress Avenue, Woodford Green. (Lep.)
King, W. E., 64, Huntingdon Street, N. 1. (Lep.)
Latham, E. B., "Hillside," Epping New Road, Buckhurst Hill, Essex. (Orn.)
Latham, Russell, "Hillside," Epping New Road, Buckhurst Hill, Essex. (Api.)
Legg, T. E., "Tintern," Mornington Road, Woodford Green. (Orn., Arch.)
Leyton Public Libraries, per the Librarian (Z. Moon, F.R.Hist.S.), Central Library, Leyton, E. 10.
Loney, Herbert, 354, Goswell Road, E.C. 1. (Lep., Bot.)
Maitland, Donald F., May Cottage, Harold Wood, Romford. (Lep.)
Mann, F. G., 21, Thurlby Road, West Norwood, S.E. 27. (Lep.)
Mera, A. L., 5, Park Villas, High Road, Loughton, Essex. (Lep.)
Mera, A. W., 5, Park Villas, High Road, Loughton, Essex. (Lep.)
Moore, J. E., 6, Alwyne Villas, Canonbury, N. 1.
Murray, C., Uphall Farm, Ilford. (Lep., Bot., Orn., Geol.)
Murray, L. C., Uphall Farm, Ilford. (Ent., Geol.)
Mutch, J. P., 405, Hornsey Road, N. 17. (Lep.)
Newbery, E. A., 13, Oppidans Road, Primrose Hill, N.W. 3. (Col.)
Newman, L. W., F.E.S., 41, Salisbury Road, Bexley, Kent. (Lep.)
*Nicholson, Miss B., 202, Evering Road, Upper Clapton, E. 5.
Nicholson, C., F.E.S., 35, The Avenue, Hale End, Chingford, E. 4. (Ast. Bot. Ent. Micr.)
Nicholson, Mrs. E.A., 42, Avenue Road, Highgate, N. 6. (Bot.)
Nicholson, Miss Muriel, 42, Avenue Road, Highgate, N.6. (Bot.)
Nicholson, Miss Margaret, 42, Avenue Road, Highgate, N. 6. (Bot.)
Payne, H. T., 70, Castlewood Road, Stamford Hill, N. 16. (Lep.)
Peacock, F. G., "Brierlea," Stormont Road, Highgate, N. 6. (Mam.)

Peacock, P. R., "Brierlea," Stormont Road, Highgate, N. 6. (Lep.)
Pearce, F. C., "Higham Court," Woodford Green. (Orn.)
Pearce, J. P., "Higham Court," Woodford Green. (Orn.)
Pickett, C. P., F.E.S., 28, Colworth Road, Leytonstone, E. 11. (Lep.)
Prout, L. B., F.E.S., 84, Albert Road, Dalston, E. 8. (Lep.)
Raven, Rev. C. E., 4, Park Terrace, Cambridge. (Lep. and Orn.)
Riches, J., 52, Calverley Grove, Hornsey Rise, N. 19. (Lep.)
Robbins, R. W., "The Rosery," Limpsfield, Surrey. (Bot., Lep., Orn., Arch.)
Robbins, Mrs., "The Rosery," Limpsfield, Surrey. (Bot., Arch., Orn.)
*Ross, J., 18, Queens Grove Road, Chingford, E. 4.
Routledge, G. B., F.E.S., Tarn Lodge, Headsnook, Carlisle. (Lep. Col. Hem.)
Russell, Rev. Canon, M.A., The Chantry, Chingford, E. 4.
Sabine, L. A. E., 10, Franconia Road, Clapham Common, S.W. 4. (Lop.)
Samuelson, Edward, Fairview, 39, The Ridgeway, Chingford, E. 4. (Mam., Rep.)
Shaw, V. Eric, "Betula," Park View Road, New Eltham. (Hym. Lep. Micr., Api.)
Sarvis, John, May Cot, Maybury Hill, Woking. (Lep.)
Sich, Alfred, F.E.S., Corney House, Chiswick, W. 4. (Lep.)
Sines, J. A., F.E.S., "Greenacres," Woodside Road, Woodford Green. (Lep.)
Simpson, W., M.B., B.S., "Polmennor," Snakes Lane, Woodford Green. (Arch. Bot., Lep., Plant Galls.)
Smith, A. C., "Horton," Mornington Road, Woodford Green. (Ent.)
Smith, C. B., 61, Onslow Gardens, Muswell Hill, N. 10. (Lep.)
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Stuart, Vernon, 78, Elgin Crescent, Notting Hill, W. 11. (Lep.)
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Todd, R. G., F.E.S., "The Limes," Hadley Green, Barnet. (Lep.)
Tremayne, L. J., 29-30, Charing Cross, S.W. 1. (Bot. Lep. Arch., Plant galls.)
Tremayne, Mrs., 29-30, Charing Cross, S.W. 1. (Orn. Arch.)
Van Lessen, R., B.Sc., 69, Downs Road, Clapton, E. 5.
Warren, S. Hazzledine, F.G.S., F.Z.S., "Sherwood," Loughton. (Prehistoric Anthropology.)
Watt, J. Mc B., Monkhams Farm, Woodford Green. (Farming and Orn.)
Wattson, R. Marshman, 32, St. Andrew's Road, Stoke Newington, N. 16. (Arch.)
Weighell, F., 6, Paddenswick Road, Hammersmith, W. 6.
Wilde, Mrs. C. L., "Lindfield," Marshall Road, Godalming. (Arch. Bot., Plant galls.)
Williams, C. H., 5, Lower Belgrave Street, Eaton Square, S.W. 1. (Lep.)
Williams, H. B., LL.B., F.E.S., 131, Queen's Road, Wimbledon, S.W. 19. (Lep.)
Willsdon, A. J., 46, Dover Road, South Wanstead, Essex. (Lep.)
Wood, H. Worsley, 31, Agate Road, Hammersmith, W. 6. (Lep.)
Wrigley, Arthur, 29, Calthorpe Street, Grays Inn Road, W.C. 1. (geol. and prehistoric antiquities.)

* Life Members.

BRANCH ASSOCIATES.

Aldworth, A. G., Ridgeway House, The Ridgeway, Chingford, E. 4.
Aldworth, Mrs. A. G., Ridgeway House, The Ridgeway, Chingford, E. 4.
Allpass, Mrs., "Heydor," Endlebury Road, Chingford, E. 4.
Allpass, E. G. H., "Heydor," Endlebury Road, Chingford, E. 4.
Bacot, Miss A. H., York Cottage, Loughton, Essex.
Connoll, Miss E., 11, Eglinton Road, Chingford, E. 4.
Crafford, Miss N. F., 11, Eglinton Road, Chingford, E. 4.
Flowers, C., 4, The Avenue, Chingford, E. 4. (Bot. Arch.)
Fulcher, Miss, "St. Helens," Woodland Road, Chingford, E. 4.
Halloway, Miss M., 19, Buxton Road, Chingford, E. 4.
Hornblower, A. B., 32, Forest Drive East, Leytonstone, E. 11.
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Hubbard, Mrs., 110, Station Road, Chingford, E. 4.
Jones, Miss, 3, Connaught Avenue, Chingford, E. 4.
Kilby, G. S., 54, Lombard Street, E.C. 3.

Lees, C. H., D.Sc., F.R.S., Tunbridge Wells.
Lewis, T. G., 61, Empress Avenue, Woodford Green.
Loram, H. Y., 49, Buxton Road, Chingford, E. 4.
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Mancell, Miss M., 4, Connaught Avenue, Chingford, E. 4.
Mathieson, Miss M. L., 7, Crescent Road, Chingford, E. 4.
Parsons, Miss L., 36, Forest Drive East, Leytonstone, E. 11.
Puck, Alec, 12, The Ridgeway, Chingford, E. 4.
Samuelson, Miss Dorothy, Fairview, 39, The Ridgeway, Chingford, E. 4.
Sheppard, J. H., "Simla Cottage," Snakes Lane, Woodford Green.
Simes, Miss H., 51, Kenninghall Road, Clapton, E. 5.
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Stratton, Miss Isabel, 37, Buxton Road, Chingford, E. 4.
Thomas, G. W., 86, James Lane, Leyton, E. 10. (Orn. and Fungi.)

COUNTRY ASSOCIATES.

Allen, William, "Southview," Spa Road, Radipole, Weymouth. (Bot.)
Allnutt, C. E., "Kyle More," Railway Approach, Worthing. (Arch.)
Bickham, Spencer H., Underdown, Ledbury. (British Phanerogams and Ferns.)
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Blake, Wm., Acacia Villa, Ross, Herefordshire. (Orn. & Conch.)
Bostock, E. D., Oulton Cross, Stone. (Lep.)
Buckley, G. G., M.D., F.S.A., Rye Croft South, Manchester Road, Bury. (Lep., Dip.)
Butler, W. E., F.E.S., Hayling House, Oxford Road, Reading. (Lep.)
Cassall, Dr. R. T., F.E.S., The Surgery, Abertillery, Mon. (Lep.)
Cooke, Rev. P. H., M.A., Ickleton Vicarage, Great Chesterford, Essex. (Bot.)
Culpin, M., M.B., F.R.C.S., (Capt. R.A.M.C.).
Elford, Rodney R., Glencoe House, 139, Rosary Road, Norwich. (Ent.)
Fison, Eliot Robert, "Sorrento," Brighton Road, Purley.
Grubb, Walter C., Barberton, Transvaal.
Hancock, G. D., Mount View, Uffculme, Cullompton.
Hopkins, Prof. F. G., M.A., M.D., F.R.C.P., F.R.S., 71, Grange Road, Cambridge. (Biochemistry.)
Longley, W., "Avesbrook," Brook Road, South Benfleet, Essex. (Lep.)
Miller, Miss E., "The Croft," Rainsford Lane, Chelmsford. (Lep.)
Moore, J. W., Middleton Dean, Middleton Hall Road, King's Norton, Birmingham.
Pike, Oliver G., "Duncombe," Marsworth, Tring. (Orn.)
Porritt, G. T., Elm Lea, Dalton, Huddersfield. (Lep., Neur., Orth.)
Portway, J. B., jun., 91, The Avenue, West Ealing, W. 13.
Studd, E. F., M.A., B.C.L., F.E.S., Oxton, Exeter. (Lep.)
Ward, J. Davis, "Limehurst," Grange-over-Sands, Lancs.
Wood, P. Worsley, M.A., Emmanuel College, Cambridge. (Field Botany).

Note. — The following abbreviations are used in the above lists :— Api., Apiculture; Arch., Archaeology; Ast., Astronomy; Biol., Biology; Bot., Botany; Chem., Chemistry; Col., Coleoptera; Conch., Conchology; Dipt., Diptera; Ent., Entomology; Geol., Geology; Hem., Hemiptera; Hym., Hymenoptera; Lep., Lepidoptera; Mam., Mammalia; Micr., Microscopy; Neur., Neuroptera; Orn., Ornithology; Orth., Orthoptera; Ool., Oology; Rep., Reptilia; Zoo., Zoology.

EXTRACTS FROM MINUTES.

(Ornithological communications included in the Epping Forest Diary (see pp. 30 to 37 are omitted.)

January 8th, 1918.—Communications.—Mr. W. H. Bell recorded having seen on the Lea marshes between Cheshunt and Broxbourne, on December 26th, 1917, several snipe; also an Otter on the bank of a small stream running by the Lea behind a wood of Alders. Mr. Bacot remarked that Otters wander over large tracts of country, and the one seen was probably not a denizen of the place.

Mr. Ross recorded large flocks of Rooks and Jackdaw in North Oxon about Christmas Day last, and mentioned that he had found the Redwings in that district early in the new year much less wild than some he had seen in Epping Forest about January 6th.

Paper.—Mr. Bacot read a paper on "Mosquitoes and the danger of Malaria in England," illustrating it with lantern slides dealing with the life-history and anatomy of the insects, and showing views of typical breeding places. After discussing the position of mosquitoes in relation to other insects and giving a brief description of the bionomics of the group, he dealt with their connection with the spread of malaria, yellow fever, dengue, and elephantiasis. He explained the distinctions between Culicine and Anopheline mosquitoes, and outlined the history of ague in England, based on articles published by Nuttall, Cobbett and Strangways, in vol. i. of the *Journal of Hygiene*. He next dealt with the possibility of a recrudescence of ague in England, owing to the return of soldiers who had contracted malaria abroad, and called attention to the need of considering the interaction of the natural enemies of mosquitoes before carrying out any campaign for the destruction of the latter. On the motion of Messrs. Hall and Ross Mr. Bacot was heartily thanked for his instructive paper.

February 5th.—Communications.—Mr. Ross reported that the snows of January 16th-17th were the cause of much damage to trees in Epping Forest. Possibly wind had played some part in the havoc, but the snow had been the chief factor. Many "spears" of pollarded hornbeams had been broken down by its weight, and some crabs and hawthorns had suffered, but the greatest damage had been done to the birches, which from their growth of small twigs had held the wet snow more. The tops of many young birches were snapped off or fractured and broken over, and the higher branches of some of the older trees were injured in the same way. The stem of the tree in which was the greater spotted Woodpecker's nest reported last year in Chingford Wood had been broken over.

Annual Pocket-box Exhibition.—Mr. C. H. Williams: long series

of selected varieties and aberrations of *Agriades coridon* from Dover, Folkestone, Royston, Dunstable, Prince's Risborough, and Alton; also, on behalf of Mr. W. E. King, two specimens of *Brenthis euphrosyne* with extremely dark borders, one bleached specimen of *Epinephele jurtina* (*janira*), two asymmetrical *Polyommatus icarus*, the left wings in both cases being indented at the apex. Mr. Shaw: aberrations of *Rumicia phlaeas* including the abs. *major*, *suffusa*, *obsoleta*, and *radiata* of Tutt, *caeruleopunctata*, Stgr., and others. Mr. Riches, on behalf of Mr. W. Southey: a series of *Agriades coridon* from Dunstable (August 15th, 1917), including one ab. *obsoleta*. Mr. Newman: *Abraxas grossulariata* from many localities including vars. *deleta* (*lacticolor*), *nigrosparsata*, *lutea*, *flaripallidata*, *centralipunctata*, and a number of examples of var. *varleyata*, including white-rayed forms and forms in which the white on the "shoulders" of the forewings was almost obliterated. *Boarmia roboraria*, showing remarkable variation in size, the smallest being not much larger than *Tephrosia punctularia*: the larvæ had been sleeved on oak. A pair of melanic examples of *B. consortaria* from Sutton Coldfield. A series of *Dicranura bicuspis* and a dark-banded form of *Agriopis aprilina*. Also, on behalf of Mr. G. B. Oliver: selected forms of *Agriades coridon* var. *syngrapha* with broad and narrow borders and some minor aberrations, the specimens showing four distinct shades of colour, *viz.*: pale blue, dark blue, greenish-blue, and dull metallic blue, and including an asymmetrical specimen with khaki streaks on the right wings; also var. *semisyngrapha* with hindwings mostly blue; an underside with hindwings showing obsolete spotting; a gynandrous specimen; males showing colour variations, some dark blue and others varying between the type and var. *fowleri*; undersides of both sexes including vars. *obsoleta*, *semi-obsoleta*, *striata*, and *striata-obsoleta*. Mr. Pickett: a long series of *Agriades coridon* from Hertfordshire (August, 1917). Males—ranging from silvery blue to *adonis* blue, with many ab. *suffusa* and one ab. *marginata* with the blue well suffused and deep bands running round all the wings; two ab. *minor*: one of a lilac blue; three very dark on the underside (approaching the female), with very large spots, and two with pure white ground colour with the spotting only faintly suggested. Females—(uppersides) colour ranging from khaki through various shades of slaty grey to intense black; three specimens with all the the wings unicolorous black; several specimens with khaki-coloured patches; many with deep red lunules on hindwings, and several with the red lunules extending round the forewings; one with the lunules yellow; several ab. *minor*; many ab. *semisyngrapha* approaching *syngrapha* (of which he showed a series from the Chiltern Hills for comparison); one remarkable specimen with right wings of the normal plain brown of the female, and left wings of a blue shade, approaching that of *adonis*, with a faint suggestion of black spots round the border, the wings being smaller than those in the right (coming under the *roystonensis* type), like a glorified *syngrapha* without the border; a long series of *roystonensis* (none crippled) all with the smaller wings and well dusted with blue (male *androconia*). Undersides —several perfect *obsoleta*: one with pure white ground colour and blind

brownish-red borders; one of a grey shade; two of a warm greyish-brown; several cinnamon brown; three blackish-brown; three approaching the male in colouration; several ab. *striata*; one specially dark with spots well-developed into lines; one with extra spotting on the forewings, and two with the usual markings on three wings and the fourth spotless.

March 5th.—Exhibits.—Mr. Cooper: a series of *Hibernia defoliaria* taken and bred from Epping Forest in 1913, 1916, and 1917; he remarked on the increase of melanism in this species of recent years.

Communications.—Mr. Cooper recorded a male *Apocheima hispidaria* in Epping Forest on February 23rd last. Mr. Burkill: an *Aglais urticae* on the wing at Chiswick, on February 24th.

Paper.—Mr. Hall gave an account of some plants found by him in West Sussex, chiefly from the district round Amberley and Chichester, during 1917, illustrating his remarks with specimens of some of the rarer and more interesting species, including *Papaver lecoqii*, *Astragalus glycyphyllos*, *Lathyrus aphaca*, *Lonicera xylosteum*, *Galium asperum*, *Valeriana mikanii*, *Verbascum lychnitis*, *Wolffia arrhiza*, *Alopecurus bulbosus*, and *Polypogon monspeliensis*. After discussing the special features of the anatomy of the various species, he dealt with some points of plant physiology, basing his remarks principally on *Wolffia arrhiza*, which he was growing for purposes of observation. This species, the smallest known flowering plant, hibernates by means of winter fronds, which, owing to an increased deposition of starch in them, fall to the bottom of the water and there pass the winter. Specimens of both summer and winter fronds were shown, and the remarks based on this species dealt with the selection and absorption of food materials, and their conversion into starch and other components of plant bodies.

April 9th.—Communications.—Mr. Austin recorded a flock of about two dozen magpies at Kirkstall, Yorks, and near the same place a pair of corn buntings, on March 29th last. Mr. Ross reported that Mr. E. R. Spragg had heard a yellow hammer singing on Woodford golf links, on March 16th, and that blackthorn was seen in flower at Chingford, on March 23rd; a grass snake, at Cuckoo Pitts, on March 24th.

Exhibits.—Mr. Ross showed photo-micrographs of (1) Prothallium of fern (*Lastrea dilatata*) with young plant about to uncurve, and (2) the same, with a plant having three young leaves. (3) Thalloid protonema of the moss *Tetraphis pellucida*, (4) the same, with a young plant, and (5) with an older plant. (6) Young gemmiferous plants of the moss *Aulacomnium androgynum*, growing from an old stem of the moss. (7) Young liverwort, probably *Lophocolea heterophylla*, growing from a leaf fragment. (8) Branch of *Ptilidium pulcherrimum*, a liverwort, (9) leaf of same. (10) Moss leaf (? *Mnium* sp.) from the socalled "Arctic bed" found at Ponder's End by Mr. S. H. Warren; the deposit belongs to the close of the pleistocene period, and is later than the period of the River-drift man.

May 7th.—Exhibits.—Mr. Ross, a sprig of hornbeam (*Carpinus betulus*) showing old fruit stalks and this year's male catkins. He stated that some botanists say that this species is monœcious and some that it is imperfectly diœcious. Investigations along certain rides in Epping Forest showed that in the autumn of 1917 about 68% of the 119 mature trees observed had abundant or a considerable amount of fruit, whilst in the spring of 1918 66% of 104 trees, along the same rides, had an abundance, or considerable amount, of male catkins.

Communications.—Mr. Austin, a female Redstart at Stamford Hill, on April 13th. Mr. Hanson, Cuckoo in Eversleigh Park Road, Enfield (April 27th); House Martin, Bush Hill (April 28th); two Swallows, Carterhatch Lane, Enfield (April 29th); Tree Pipit, Winchmore Hill Railway bank (May 2nd); two Nightingales, Winchmore Hill Woods (May 4th).

Lecture.—Mr. F. J. Stubbs, Curator of Stepney Borough Museums, lectured on "Migration," and the substance of his lecture will be found on pp. 24 to 29.

June 4th.—Exhibits.—Mr. C. Nicholson: Larvæ, pupæ, and cocoons of *Plusia moneta* from his garden at Hale End. He remarked that he had found this species exceptionally common in the garden this year, and one cocoon had evidently been torn open and the pupa extracted by a bird, probably a Blue Tit, which had been seen lurking about in a suspicious manner where the cocoon was found.

Communications.—Mr. Ross reported the oaks in Epping Forest were infested with larvæ on May 25th and 26th and parties of rooks and jackdaws were very restless and noisy about the tops of the trees apparently attracted by the larvæ. Mr. Hall recorded *Carex strigosa* from near Wormley, Herts., and exhibited a specimen. Mr. Robbins reported the cuckoo as extremely abundant at Limpsfield this year.

Paper.—Mr. C. Nicholson read "Some Entomological Notes from Gloucestershire," covering a period of five summer holidays in the Stroud District in the years 1912 to 1916. The paper having appeared in substance in the *Entomologists' Monthly Magazine* for May, 1917, a copy has been deposited in the Society's library, and further comment is therefore unnecessary, except to record that Mr. Nicholson exhibited a small collection of insects of various orders in illustration of his paper.

September 3rd.—Exhibits.—Mr. A. W. Mera: *Argynnis aglaia* and *Hyria auroraria* from Surrey, and remarked that some of the *aglaia* were taken on marshland, whilst previously he had taken that species only on top of the downs. [Both *aglaia* and *adippe* occur in boggy spots in the New Forest, and are fond of visiting the flowers of the marsh plume thistle (*C. palustris*).—C.N.] Mr. C. H. Williams, a fine collection of *Agriades coridon* taken at Prince's Risborough, on August 18th last, including a male entirely dark grey without any blue tint.

Communication.—Mr. Hall recorded a larva of *Stauropus fagi* on birch (*B. pubescens*) instead of beech, at Wormley, and mentioned that it was resting on a twig. Mr. Austin read some notes of a holiday

spent at Wensleydale, Yorks., from August 9th to 19th last. The Wheatear and Willow Warbler were common, and half a dozen Redstarts were seen, but only one Dipper. The Pied Wagtail was not frequent, but many Yellow Wagtails were seen, all being birds of the year with the plumage not quite adult. Meadow Pipits and Sand Martins were common; Chaffinches and Starlings in large flocks; Magpies not frequent; Jackdaws and Rooks common. Several Kestrels and Herons were seen, and Mallards came down to the river; all these were birds of the year. Red Grouse seemed common but were said to be scarce owing to disease. There were a few Common Snipe on the river, and the Common Curlew was in parties of four and five, but not in great numbers. The Black-headed Gull occurred solitarily. Possibly a Bittern was seen, but this turned on the question of plumage, there being just a chance that it was a young Heron.

October 1st.—Exhibits.—Mr. Ross: specimens of Mycetozoa, *viz.*: *Cribraria argillacea* and *C. aurantiaca* on oak, and *Dictydium cancellatum* on hornbeam, and mentioned that these species are usually found on coniferous wood; also some old sporangia of *Craterium minutum* on the female inflorescence of a liverwort *Marchantia polymorpha*.

Lecture.—Mr. R. Paulson, F.L.S., lectured on "Lichens," illustrating his remarks with a fine series of lantern slides, some of which showed how some insects were coloured in a way that protected them on lichen-covered trees, rocks, walls, etc.

Mr. Paulson said that it had been stated that Middlesex is the poorest county in the British Isles when we considered the number of lichens growing within its borders, and that Hertfordshire is a good second. There are good reasons why lichens in the immediate neighbourhood of a large town should be scarce; they had been described as creatures of light, and had been said not to tolerate any impurity in the atmosphere. Middlesex and Herts are certainly poor counties for lichens, but not so poor as the statement would lead one to suppose. If a radius of twenty miles from Charing Cross is taken the number is not so small, there being at least 130 good species within that radius—one-tenth of the number to be found in the British Isles. Lichens might seem scarce in woods and on commons in the environs of London, but that might be because they are inconspicuous. We had no great sheets of lungwort such as grew in pine woods in the mountains, and we had no sheets of reindeer moss. The lichens we have, though inconspicuous, are, some of them, distinctly beautiful, and within fifteen miles of the centre of London, there are a number of lichens that appear merely as stains on flints.

Lichens are amongst the foremost of the pioneers of the vegetable world. When a rock that has hitherto been barren shows signs of colonisation by vegetable life it frequently happens that lichens are amongst the first signs of vegetation. These would be of the crustaceous or crustose form, which in its earliest stages is a mere film. After that another form follows, which has a leafy appearance—the

foliaceous or foliose form. The third form was the fruticose form. All these forms were represented within the twenty mile radius. There was a regular progression of vegetation on newly exposed soil that had hitherto been barren, and on rock that had been exposed by the fall of a cliff or other movement.

Whatever may be its shape and appearance a lichen consists merely of a cellular structure. The family is included in the group of cryptogams known as the Thallophyta. Dr. Farrow has been working out the ecology of some heaths near Tuddenham, in Norfolk, where the rabbit was extremely vigorous, and where there has been retrogression of plant life instead of progression. First of all shrubs began to disappear; then the heather was attacked and killed, and then the grass. After the heather and grass had been killed, lichens began to appear, but in the opposite order, first the foliose and then the crustose; then these disappeared, and left the barren sand.

Lichens are also classified according to the substratum on which they grow; those growing on rocks are called saxicole, on wood, lignicole, and those on earth, terricole.

A lichen not known to science before February, 1910, was then found in Surrey by Mr. Starling. In November of the following year he had the good fortune to find it in Epping Forest. Though we have but a small number of lichens within the twenty miles radius, it is possible to find this one, which, so far as he knew, has only been found in these two localities. The species formed a web of green thread-like bodies on the soil, and was known as *Gongylia viridis*.

Lichens are dual organisms, and consist of two plants—an alga and a fungus—growing in close relationship. Investigations show that the growth of lichens is encouraged by light, and that while the south-west side of trees is often covered, the north-east side is bare.

There is a notion that lichens live to a great age and grow at a slow rate, but there are a number that must grow fairly rapidly, in proof of which Mr. Paulson showed lichens in fruit on fir cones, on the bone of a sheep, on the bark of a plane tree, and on rabbit pellets.

Mr. A. Bacot proposed a vote of thanks to Mr. Paulson, and suggested that the disappearance of some species of insects from the London district, and the appearance of melanism in the geometrids and other moths, are due to the disappearance of lichens from trees in the London area.

Mr. Ross seconded the vote.

Mr. Robbins, supporting the vote, suggested that the deficiency of light is more harmful to plant life than impure atmosphere, and is a much greater factor than we have been accustomed to think.

Mr. Paulson, replying to questions and observations, said that the lichen flora of Epping Forest is undoubtedly regaining what it had lost. There is no doubt that many lichens which were disappearing, and many which struggled on, never bearing fruit, were now found in a healthy state. The Smoke Abatement Act must have lessened the smoke that drifted over London, and must have had effect in reviving the lichen flora. As to the intensity of the light, there is no doubt at all that lichens do best where there is a large amount of light; merely

taking the light away by increasing the smoke and fog would tend to make the lichen growth less luxriant. It is very likely that the insects that had disappeared will return as the lichens do. By the Smoke Abatement Act we got rid of some of the smoke, but we have not got rid of sulphuric acid, which lessens the vigor of, if it does not actually destroy, many of the cryptogams. The lichen flora that has been so much rejuvenated in Epping Forest, is the ground flora, not the tree flora. Possibly, as rain water trickles slowly down the tree trunks the plants are washed with water containing sulphuric acid. With regard to the condition of the lichen flora in districts round London, he had come to the conclusion that the trunk of the tree was not always the greatest factor, for the edaphic (soil) conditions produce differences in the humidity of the atmosphere, and thus greatly affect growth. The lichen flora is much more sparse on dry soil where we get *Quercus pedunculata* than where we get *Q. sessiliflora*, and he believed that the soil has much to do with it. On sandy soil in Surrey lichens are more abundant and luxuriant—in numbers, but not in species.

November 5th.—Exhibits.—Mr. Ross: jaws and other remains of Short-tailed Field Vole, recovered from pellets of the Tawny Owl near Cuckoo Brook, Epping Forest, on 2nd inst.; also similar remains containing wingcases of beetles recovered from pellets found in May last.

Communications.—Mr. Ross, on behalf of Mr. C. Nicholson, recorded the occurrence of the Coccid, *Aspidiotus zonatus* in Lords Bushes, Epping Forest; Mr. J. W. H. Harrison, who identified the insect, says it is rare in the north. Mr. Hanson said the latest date he had observed the Swallow was October 20th (at Winchmore Hill), and on the same day the House Martin (at Chingford); he again saw the Kingfisher on the New River at Bush Hill Park, on October 20th, and on the same day eight gulls flying over the Forest.

Paper.—Mr. H. B. Williams, who was on service in Ireland, contributed "Random Notes from North-east Ireland," which were read on his behalf by Mr. Shaw. These notes have been published in the *Entomologist's Record* (May 15th, 1919, pp. 53 to 56) which can be consulted in the library.

December 3rd.—Exhibits.—Mr. Riches: a bred series of *Plusia moneta* from Hornsey Rise, 1918. Mr. Bowman: pale forms of *Rumicia phlaeas* (one approaching ab. *schmidtii*, Epping Forest, August 3rd, 1913); suffused forms, including one almost wholly black (Horsley, August 20th, 1910), only a small amount of the coppery colouring being present on the forewings.

Communications.—Mr. Newman remarked on the late emergence of a brood of *Polygonia c-album* in his breeding cages. The larvæ had fed up slowly and the imagines appeared November 25th to 27th and were to-day flying actively about his hot-house.

ARCHAEOLOGICAL SECTION. REPORT FOR 1918.

1. Owing to war conditions the Section has not found it possible to make any inspections or excursions during the year.

2. Three meetings of the Section were held, *viz.*, on March 19th, May 21st, and October 29th.

3. At the Meeting on May 21st, which was well attended, Mr. W. J. Maxton, of the Battersea Field Club, lectured on the Daily Life of a Mediæval Monastery.

4. On October 29th Mr. E. Chapman read a paper on "Some Churches of South Sussex" (New and Old Shoreham, South Lancing, Sompting, Steyning, and Bramber).

5. The MS. of Mr. Chapman's paper as above, and the Record of the visit on July 14th, 1917, to the Earthworks of Epping Forest, have been placed in the Society's Library.

E. B. Bishop, *Chairman.*
E. Chapman, *Secretary.*
November 20th, 1918.

REPORT OF THE COMMITTEE OF THE ORNITHOLOGICAL SECTION.

1. As stated in the Report for 1917, the Ornithological Members of the Society decided to adopt the suggestion of the Council and to form themselves into an Ornithological Section. Thirty-three Members of the Society intimated their willingness to join, and were duly registered. At the first Meeting of the Section, on November 20th, 1917, a Committee was elected, consisting of the following Members: —Mr. S. Austin, as Chairman; Mr. A. Brown, as Secretary and Recorder; together with Messrs. C. S. Bayne and P. J. Hanson. Owing to the demands on the Secretary's time, Mr. L. J. Tremayne agreed to undertake the recording work as Acting Recorder. Mr. Bayne had to withdraw from active work on the Committee on account of taking up military duties. (These officials have been re-elected for 1919.)

2. Eight Members of the Section are still absent on active military service. It is hoped that on their return to civil life, at no distant date, they will be in a position to resume Ornithological work for the Society.

3. Four evenings were allotted by the Council for Sectional Meetings, and one Field Excursion was held during the year. Four Committee Meetings were also held. A Paper on "Bird Migration," by Mr. F. J. Stubbs (Curator of the Stepney Borough Museums), postponed from last year, was arranged by the Committee for an Ordinary Meeting of the Society, on May 7th. With reference to this lecture, the Committee would like to place on record that, in their opinion, Mr. Stubb's theory respecting the law of migration is of the

utmost importance, and may well prove to be of an epoch-marking nature. The Committee also provided Papers for the Chingford Branch—on March 11th, "Some Rarer British Breeding Birds," by Mr. P. J. Hanson—and on December 2nd, "Some Ornithological Notes by an Amateur," by Mr. S. Austin.

4. Two valuable reports on the Avifauna of Salonica and Macedonia have been received during the year from our member Mr. W. E. Clegg, R.A.M.C., on service in these districts. Both reports have been read at meetings of the section, and it is hoped that practical use may be made of them at a later date. A communication from Mr. C. S. Bayne (while on service), on the change of plumage in the Black-headed Gull, was also read.

5. The 1918 Report on the Birds of Epping Forest is printed elsewhere in the Transactions. Records from members, and others, will be welcomed.

6. The Committee have long felt the need of a suitable map showing the Society's local district and its sub-divisions. Such a map should be in the hands of all those assisting in the work of recording, and it is the Committee's intention to press upon the Council the absolute necessity of issuing in a suitable form such a map for distribution.

7. No instances of ringing, under the "British Birds" Marking Scheme, have been recorded by members of the section, and no recoveries of past markings have been reported.

8. No additions to the collection of photographs of birds and nests have been received during the year.

9. The Acting Recorder has drawn up a Report on the present state of the Records of the Section, which discloses the fact that great disparity exists between the numbers and interest of records received from the various divisions of the Society's district. The Report also includes some valuable suggestions as to improved methods of working, which suggestions the Committee have adopted. Annual statistics of the records received will be published, by which means the poorly recorded sub-districts will be disclosed, and it is hoped that additional help in recording will be forthcoming. The statistics of the ornithological records up to the end of 1918 are as follow:—

(*a*) The total number of notes recorded for the 24 sub-districts during the year 1918 were 1296, divided as under:—

NORTHERN DISTRICT.

Sub-district.		
No. 1.	Colnbrook	1
2.	Rickmansworth ...	—
3.	Hounslow	32
4.	Harrow	18
5.	Mimms	44
6.	Hampstead	113
7.	Enfield Chase	88
8.	Lea Valley	44
9.	Epping	535

Sub-district.		
10.	Hainault	23
11.	Brentwood	75
12.	Rainham	34
		1007

Southern District.

Sub-district.		
No. 1.	Weybridge	1
2.	Wimbledon	140
3.	Chessington	4
4.	Norwood	16
5.	Banstead	21
6.	Caterham	23
7.	Holmesdale	2
8.	Blackheath	66
9.	Kent Marshes	1
10.	Darenth	6
11.	North Downs	3
12.	Westerham	6
		289

(*b*) The total numbers of different species of birds and nests recorded in the various subdivisions, since the scheme was started, up to the end of 1918, are as follow :—

Northern District.

Sub-division.		Birds.	Nests.
No. 1.	Colnbrook ...	44 ...	5
2.	Rickmansworth ...	64 ...	29
3.	Hounslow ...	71 ...	11
4.	Harrow	78 ...	32
5.	Mimms	33 ...	9
6.	Hampstead ...	108 ...	45
7.	Enfield Chase ...	94 ...	35
8.	Lea Valley ...	116 ...	42
9.	Epping	124 ...	77
10.	Hainault	68 ...	52
11.	Brentwood ...	75 ...	46
12.	Rainham	47 ...	46

Southern District.

Sub-division.		Birds.	Nests.
No. 1.	Weybridge ...	1 ...	2
2.	Wimbledon ...	60 ...	5
3.	Chessington ...	6 ...	1
4.	Norwood	13 ...	—
5.	Banstead	21 ...	—
6.	Caterham... ...	17 ...	6

Sub-district.					
7.	Holmesdale	...	2	...	1
8.	Blackheath	...	33	...	4
9.	Kent Marshes	...	1	...	—
10.	Darenth ...	...	5	...	2
11.	North Downs	...	3	...	—
12.	Westerham	...	6	...	1

N.B.—The year 1918 represents the first year's work for the Southern District.

10. The collection of records for the southern part of the Society's district has now been undertaken by the Section. Owing to so many of the members being away on active service, or otherwise engaged on war work, the recording done, both North and South, has been but small. Help in this work is badly needed.

Our thanks are due to all those members of the Society who have assisted us in our work, and also to the following friends, to whom we are indebted for so many of our most interesting records and notes, *viz.*:—The Misses A. Hibbert-Ware and G. M. Towsey, and Messrs. J. E. S. Dallas, R. Hay Fenton, G. R. Humphreys, H. C. Playne, C. N. Roper, R. P. Sewell, E. R. Spragg, and F. J. Stubbs.

11. Three species new to the Northern area have been recorded during the past year, making the total number 153. These new occurrences are, *Merlin* (Falco æsalon), seen flying over the golf course at Theydon Bois, on January 20th, 1918; a skein of about 15 *Grey-lag Geese* (Anser anser), from the same district, on March 22nd, 1918; and the *White-fronted Goose* (Anser albifrons), also from the same district, in the winter of 1917-18; reported by Mr. F. J. Stubbs, per S.A. and A.B.

12. Other interesting records are as follow:—Northern district.—*Curlew* (Scolopax arquata), Theydon Bois, on January 6th, 1918; *Herring Gull* (Larus argentatus), Theydon Bois, on March 3rd, 1918; and *Magpie* (Pica pica), Navestock, on December 7th, 1918. Reported by Mr. F. J. Stubbs per S.A. and A.B., *Kingfisher* (Alcedo ispida), nesting, at Woodford, April 23rd, 1918; *Lesser Redpoll* (Acanthis linaria cabaret), nesting, at Woodford, May, 1918; *Wryneck* (Jynx torquilla), observed near Theydon, on April 25th, 1918, and near Chingford Hatch, on April 30th, 1918. Reported by Mr. H. C. Playne, per S.A., *Lesser Redpoll* (Acanthis linaria cabaret), heard in Great Monk Wood, on June 1st, 1918, and June 8th, 1918. Reported by Mr. R. Hay Fenton, per S.A., *Whinchat* (Saxicola rubetra), Warren Plain, Loughton, May 12th, 1918. Reported by Messrs. S. Austin and A. Brown, *Buzzard* (Buteo buteo), Ilford, on May 9th, 1918. Reported by Mr. Colin Murray; *Wheatear* (Œnanthe œnanthe), Bush Hill Park, on September 6th, 1918; and *Red-backed Shrike* (Lanius collurio), nested at Bush Hill Park, on May 23rd, 1918. Reported by Mr. P. J. Hanson, *Spotted Flycatcher* (Muscicapa grisola), pair and three young in Springfield Park, Clapton, on July 21st, 1918; and *Tufted Duck* (Nyroca fuligula), female and three young on Racecourse Reservoir, Walthamstow, on July 21st, 1918, reported by Mr. A.

Brown. *Great Spotted Woodpecker* (Dryobates major anglicus), pair and young bird, nested near Ludgate Plain, June 15th, 1918; *Wheatear* (Œnanthe œnanthe), male bird, near Fairmead, October 6th, 1918, reported by Mr. J. Ross.

Southern District.—*Sparrow Hawk* (Accipter nisus), nest, eggs and young birds, Warlingham, June 6th to July 20th, 1918, reported by Mr. J. E. S. Dallas, per S.A. *Wheatear* (Œnanthe œnanthe), seen on Ham Common, on May 11th, 1918, reported by Miss G. M. Towsey per S.A.

For the Committee of the Ornithological Section of the L.N.H.S.

A. Brown, *Secretary.*
January 31st, 1919.

REPORT OF BOTANICAL SECTION.

During the year three sectional meetings have been held on the undermentioned dates:—

March 19th.—Discussion, "Critical Grasses of the London District," introduced by L. B. Hall, F.L.S.

September 24th.—Exhibits, Records, and Communications.

November 26th.—Exhibition and discussion, "The Genus Polygala," introduced by R. W. Robbins.

The two meetings fixed for February 19th and July 18th, respectively, fell through.

The Section was also responsible for an excellent lecture on October 1st, before the Society, on "Lichens," by Mr. R. Paulson, F.L.S.

No excursion took place during the year.

The Section and the Society generally have suffered a grievous and irreparable loss through the death of Mr. C. S. Nicholson. For the last few years his health has been such as to preclude any sustained botanical work, but we had all hoped until the last that he would be spared to us for some time to come. Only those who came into intimate association with him know the immense amount of quiet painstaking work performed by him on behalf of the Society in recording, in perfecting the Herbarium, and in numberless other ways. His kindly personality will be keenly missed by all of us, and his many friends will always hold him in affectionate remembrance.

As regards the northern portion of our area the sad news above mentioned makes it obvious that very little additional recording has been accomplished during the year.

The new records for the southern portion, that have come to hand and been dealt with, include no rare species. Mr. L. J. Tremayne has rendered useful service in filling up gaps with lists of more or less common species, observed by him in his tramps in the outer suburbs, etc.; and Mr. R. W. Robbins has compiled records of plants observed round about Limpsfield. Our records would rapidly become more complete if other members would follow these excellent examples, sending specimens to our recorders whenever possible, especially of the rarer and more critical species.

During 1918 26 new species were added to the Southern District List, the most noteworthy being the following:—

Alchemilla vulgaris, Linn. — *Galinsoga parviflora*, Cav.
Silaus flavescens, Bernh. — *Marrubium vulgare*, Linn.
Gnaphalium sylvaticum, Linn. — *Orchis pyramidalis*, Linn.

Outside the Society's area the most interesting records by our members have been *Salix pentandra*, Linn., discovered by Mrs. C. L. Wilde, near Tewkesbury, in September, 1918, which, on the authority of Mr. G. Claridge Druce, F.L.S., is the first record for this species in Gloucestershire. Mr. L. J. Tremayne records *Cladium mariscus*, Br., from Swanborough Lake, Arundel Park, Sussex. It appears, however, that this species was recorded from the before-mentioned station in 1875, by Rev. J. Fraser, and is known to have been introduced. (See "Journal of Botany," 1901, p. 419.) It is of some interest to find that the species has persisted there for at least 43 years, but there is no record of *C. mariscus* as a native of Sussex. Mr. R. W. Robbins has found *Osmunda regalis*, Linn., in an undoubtedly wild situation in Surrey, but it is not deemed advisable to mention the exact locality.

R. W. Robbins, *Chairman.*
C. L. Wilde, *Secretary.*
November 18th, 1918.

LEPIDOPTERA SECTION—REPORT FOR 1918.

Owing to the falling off in the number of members at the meetings, the work of this section has been greatly hampered during the year under review, and it is to be hoped that a special effort will be made by members, especially those resident in or near London, to attend the meetings more regularly in the ensuing year. The war has been mainly responsible, both directly and indirectly, for the small attendance at our meetings, but with the restoration of peace we are looking forward to fuller support in order to ensure the successful working of this Section.

Exhibits.—Of the exhibits the following are noteworthy:—

Dr. Cockayne exhibited butterflies from the north-east corner of Russian Lapland, comprising *Aporia crataegi*, *Pieris brassicae*, *Pieris napi* var. *bryoniae*, *Colias palaeno* var. *lapponica*, *Erebia lappona*, *Erebia disa*, *Brenthis freija*, *Aphirape*, and *Pales* var. *optilete*, *Thecla rubi*, and a bred series of *Vanessa urticae*.

Mr. A. W. Mera showed preserved larvæ of *Amphidasys betularia*, the colour of which had been influenced by the food-plant, those that had fed on blackthorn and beech being dark brown, whereas those that had fed on sallow were green; also a series of *Demas coryli* bred from Epping Forest larvæ, in several examples of which the chocolate bar on the upper wings was so pale as to be hardly discernible.

Mr. V. E. Shaw showed an example of *Limenitis sibylla* from the New Forest, including an example of var. *nigra*.

Mr. R. T. Bowman exhibited a long series of *Cidaria truncata* bred from a ♀ captured in June of last year, at Horsley, the series includ-

ing third and fourth broods, which emerged in October and December respectively. In these two broods, the yellow forms, which the second brood produces, were entirely absent, and the examples were remarkable for their size, being mostly as large as the original wild captured ♀ ; also an almost black example of *Cymatophora octogesima*, captured at Chingford.

Mr. C. H. Williams showed aberrant examples of *Lycaena coridon*, including vars. *syngrapha*, *fowleri*, and *obsoleta*, also a nicely striated ♀ underside and a slate coloured ♂ from Royston, the latter being a very rare form.

Communications.—Some interesting notes were received from Mr. L. B. Prout regarding the lepidoptera he had met with this season in the Godalming district, and called forth an expression of appreciation from the members of the Section who had the privilege of hearing them.

The following is an extract from Mr. Prout's notes :—

Xylina socia.—Two hibernated examples taken on palings, January 15th.

Hibernia leucophaearia.—Two examples taken on January 15th. Abundant throughout February in interesting variety.

Hibernia marginaria.—First noticed on January 21st, lasting until the end of March. Some male examples were dark, but not of the extreme infuscated form.

Nyssia hispidaria.—Only one example seen on February 27th.

Phigalia pedaria.—Occurred freely, commencing on January 22nd.

Anisopteryx aescularia.—Appeared on March 1st, but scarce.

Hibernia rupicapraria.—One seen on February 15th.

Tephrosia bistortata.—In fine form from February 11th until well into May, though scarce and mostly worn after the middle of April.

Anticlea badiata.—First appearance on March 15th.

Xylocampa areola.—First appearance on March 16th.

Brephos parthenias.—First appearance on March 21st, and afterwards abundant.

Euchloë cardamines.—First appearance on March 24th, an extremely early date.

Pachycnemia hippocastanaria.—Abundant on March 22nd.

Amphidasys strataria.—An example taken on March 23rd.

Vanessa polychloros.—Common the previous year.

The sallows produced *Taeniocampa stabilis*, *incerta*, *munda*, *gothica*, *pulverulenta*, and one example of *miniosa* on March 20th ; also hibernated examples of *Scopelosoma satellitia*, *Cerastis vaccinii*, and *Gonoptera libatrix*.

Geometra papilionaria. —Rather scarce.

Macroglossa bombyliformis.—Very plentiful, a catch of 29 having been made by two collectors in one afternoon.

Sesia sphegiformis.—An example taken at buckthorn bloom (*Rhamnus frangula*), on June 12th, together with *Melanippe hastata* and the " Pyrale " *Eunychia octomaculata.*

Nemeobius lucina.—A few examples seen.

Zygaena trifolii.—First seen on May 26th, and soon became very common. One or two fine confluent forms taken.

Palings produced *Hadena dentina, thalassina, genistae, Xylophæsia rurea, Aplecta nebulosa, Xylina socia.*

Thera variata.—Fairly common among spruce.

T. obeliscata.—Common among Scots pine.

Zonosoma pendularia, porata, and *punctaria.*—Occur freely.

Z. omicronaria.—Very scarce ; maple not much in evidence.

Asthena luteata.—Rather uncommon.

Eupisteria obliterata.—Common wherever alder occurs.

Tephrosia crepuscularia.—Appeared on May 18th, but rather scarce.

T. consonaria.—First appeared on May 3rd, but scarce.

T. luridata.—Fairly abundant.

Boarmia consortaria.—Appeared on May 17th and was still to be found in the middle of June—abundant.

Epione advenaria.—Common among bilberry and also in some woods, where it affects one of the alternative food-plants.

Melanippe hastata.—Not uncommon.

Reports.—Mr. Newman reported that in certain lanes in North Kent, where in previous years he had taken numbers of larvæ of *Lasiocampa quercifolia,* they were scarce this year. In one lane, however, in contrast, he had to record the taking of no fewer than 84 larvæ in a short space of time.

R. T. Bowman, *Secretary.*

February 4th, 1919.

REPORT OF PLANT GALL SECTION, 1918.

During the year 1918 a considerable number of records have been made in reference to the distribution of Plant Galls in the Society's district. Mr. L. J. Tremayne has given special attention to the occurrence of the commoner species, and has sent in a large number of notes with localities of species observed.

The following species, which are not mentioned in Swanton's "British Plant Galls," are worth special note:—

On *Radicula amphibia,* Druce.

Contarinia nasturtii, Kieff.

Flower swollen, ovid. Near Richmond, Surrey, June 24th, 1918, L.B.H. Given by Houard as occurring on the continent on *R. palustris* and *R. sylvestris,* but not mentioned on *R. amphibia.* Given by Carpenter as occurring in Britain on *Brassica rapa.*

On *Stellaria holostea,* L.

Perrisia silvicola, Kieff. (Houard 2311.)

Larvæ in pouch formed by two terminal leaves of shoot. Whitchurch, Middlesex, September 22nd, 1917, L.B.H. Record for the North of England by Bagnall and Harrison, published May, 1918, as new to Britain on this host plant.

On *Medicago lupulina,* L.

Perrisia lupulinae, Kieff. (Houard 3507.)

Globular axillary gall. Amberley, etc., West Sussex, June 27th, 1917, L.B.H. Record for Durham published by Bagnall and Harrison, in May, 1918. Mr. Burkill has found the same species forming a pouch of the folded leaflet.

On *Trifolium repens*, L.

Briophes plicator, Nal., var. *trifolii*, Nal. (Houard 3560.)

Flower head converted into a bunch of diminutive stalked leaves. Broxbourne, Herts, July, 1909, L.H.B.; Bosham, W. Sussex, August, 1917. Recorded on "Clovers" in the North of England, by Bagnall and Harrison. Record published May, 1917.

On *Pimpinella saxifraga*, L.

Lasioptera carophila, F. Loew. (Houard 4448.)

Larvæ in swellings at base of umbel. Biggin Hill, Kent, September 30th, 1917, L.B.H. Recorded for Durham by Bagnall and Harrison, in May, 1918.

On *Populus tremula*, L.

Eriophyid. (Houard 500.)

Margin of leaf inrolled, wrinkled, not pilose. Epping Forest, Essex, June, 1916, J. Ross and L.B.H.

On *Populus tremula*, L.

Harmandia globuli, Rubs. Larvæ in rounded swellings, usually bright red, on upper surface of leaves. This gall resembles small examples of the common *H. tremulae*, but differs in having much thinner walls, is less rounded in section, and forms a much blunter angle where it joins the leaf blade. Winchmore Hill, Middlesex, July, 1917, also in Surrey, Herts, and Sussex, L.B.H. Recorded by Houard for "Europe totale," but I cannot trace any previous record for Britain. It is frequent in the London district, but has probably been overlooked owing to its resemblance to *H. tremulae*.

L. B. Hall.

November, 1918.

CHINGFORD BRANCH—REPORT FOR 1918.

There has again been a small increase in the local membership and, notwithstanding the unfavourable war conditions, the general interest in the branch has been more than kept up, as instanced by the increased average attendances. These were 28·2 as against 18·4 in 1917, or more than 50 per cent. better. The lowest was 15 (on a very stormy evening) and the highest 60.

There were nine indoor meetings, at which the following lectures or papers were given:—"Notes on some Notable Naturalists," by Canon Russell; "Moths and Butterflies, Pupæ and Imagines," by R. T. Bowman; "Some rarer breeding birds," by Mr. P. J. Hanson; "Our Chingford Forest," by Mr. J. Ross; "Nature Notes in Epping

Forest," by Mr. Hugh Main ; "Rambles in the Alps and Jura," by Mr. E. Samuelson ; "The larger Fungi of Epping Forest," by Mr. F. G. Gould : "Insect transmitters of disease," by Mr. A. W. Bacot ; "Some Ornithological Notes by an amateur," by Mr. S. Austin.

The Chairman of the branch is the Rev. Canon Russell, M.A., and the Secretary, E. Samuelson, 39, The Ridgeway, Chingford, E. 4.

MIGRATION AS A BIOLOGICAL FUNCTION.

By Fredk. J. Stubbs.

(Delivered in substance before the Society, May 7th, 1918.)

When approaching the subject of migration two things should be borne in mind, or, rather, accepted as necessary axioms, not to be ignored if we would understand this great function of life. For I call migration a function. It is more than a mere instinct or a habit; it by no means confined to birds; and its influences reach the life of all organisms, animal or vegetable, which inhabit the earth. The first point to be remembered is that migration as a study should not be the monopoly of the ornithologist, and that the phenomenon is more intimately bound up with the science of botany. The second point is the magnitude of the process of migration, so far-reaching that it exceeds in importance every terrestrial manifestation with the exception of life itself.

As migration is based on plant life it may be necessary to present a short sketch of one or two facts in elementary vegetable physiology. If one asks a man for his opinion on the source of plant food he is almost certain to mention the soil, and to omit the other factors. Really, of the four prime plant needs, soil is the least important, and is dispensed with by the many rootless aquatic plants which exist in the sea or in fresh waters. A better answer would substitute for the term "soil" the various *inorganic* substances which are needed by the plant, and which can be derived only from the earth, and then only in the form of watery solutions. Water is thus another of the four essentials. No plant can develop without it, and in a frozen land, or in a perfectly dry desert, either sandy or rocky, no vegetable can live.

But the most important of plant foods is derived from the air. This is the element carbon, the basis of all living substances, either animal or vegetable. The biologist, according to the bias given by his special studies, may claim the prior importance of oxygen, or of hydrogen, or of nitrogen, all of which are vital; yet the following remarks will show why I believe that carbon (and, moreover, the carbon of the atmosphere alone) is the real basis of life. Carbon is present in the air in the proportion of about ·04 per cent., and is taken up by plants through the stomata of the leaves. Submerged aquatic plants have no stomata, but for the sake of simplicity, without violating any law, I can treat all plants now as though they were terrestrial. Water consists of hydrogen and oxygen (H and O are well-known symbols for these elements), while atmospheric carbon is in the form of carbon dioxide (CO_2).

From these three elements are built up the carbohydrates—C, H, and O, in various proportions—on which are based all plant tissues, and, it is equally important to remember, all animal tissues also. The

animal cannot eat, or at least cannot derive nourishment from, any combination of lifeless air, water, and earth. It depends entirely for food on the tissues of plants, so that the animal, from the amœba to man, is a sort of parasite on the vegetable world ; and the basis of all this life consists of the carbon making its way through the microscopical stomata of the growing plant. The green leaf is thus the veritable cradle of life.

The fourth requisite of the growing plant is a force so great and so universal that it may be mentioned last for no other reason than the fact that it is not confined to our earth alone. I refer to sunlight, without which no plant can gather carbon. The assimilation of this element takes place only in the actual presence of sunlight. Water, soil, and carbon are (we can say) present everywhere. The abundance or poverty of vegetation is governed only by the amount of sunlight falling on that particular part of the world.

Solar energy, therefore, can now be mentioned as the source of all life. This fact, the bare statement of which by itself may seem like a fragment of unscientific mysticism, is unquestionable, and it ought really to be the foundation stone of all biological science. Too often the student is left to discover it for himself, and may perhaps advance far in his particular field without divining the dependence of life on the sun. Plants store solar energy, turning it into potential energy, while animals in digesting the vegetable tissues change it into the kinetic energy which we see as the manifestation of animal life. Plants hoard life, animals spend it. Are we to be credited with anything in return ? Certainly ; for, by our activities, we release the carbon, returning it to the atmosphere to be again used by the plant. Were plants ceaselessly growing, and were no carbon being returned to the air by animals, life must come to an end. Remember also that oxygen, essential to animals, is a waste product of plants, and is evolved copiously in sunlight. Each of us, plant and animal, thus lives on the waste products of the other, a "balance of life" beautifully illustrated in a good aquarium, which may be sealed from the air and yet remain full of vigorous life for year after year if allowed to gather the energy poured out by the sun.

A little thought will show that the amount of sunlight reaching all parts of the earth outside the tropics varies according to the season. At the North Pole there is sunlight for half the year, and darkness during the remaining six months. In England the conditions are not changed to this extreme, but we get (say) eight hours sunlight each day in winter, and sixteen in summer. Experience of aquaria teaches us that a certain amount of plant life is necessary to support a certain fixed amount of animal life. This is equally true for a country or a hemisphere. Those parts within the Arctic Circle where the temperature rises above freezing point (thus releasing the water) are covered in summer with luxuriant vegetation, tirelessly gathering the carbon from the air, ceaselessly evolving the oxygen so necessary to ourselves. In order that the greatest possible amount of life may be crowded into the earth, in order that the last fraction of solar energy may be captured, it is essential that the carbon stored by these Arctic plants be returned to the air.

To a large extent this work is accomplished by insects and other lowly organisms which die down like the plants at the approach of the dark winter. In the same way, but not in so marked a form, this process of summer life and winter sleep obtains in temperate lands also, the contrast varying according to latitude. Clearly a summer woodland or meadow can support more life than the same area in winter. Co-ordinated hibernation by plant and animal might be deemed sufficient to maintain the balance of life until we study the danger of plants allowing their stored carbon to become locked up in the soil as peat or as coal. It is probable that these deposits of carbon, the proper place for which is in the atmosphere, indicate great catastrophes to animal life in distant epochs.

For the balance of life on the earth to be maintained, and for the support of the greatest quantity of organic life, it is necessary to have a highly locomotive form of animal life flowing twice yearly from hemisphere to hemisphere. The whole of the animal population need not move. A part may hibernate; another part, in the Tropics, may be able to exist without change throughout the year; even such animals as the fox or the pike are compelled in temperate lands to confine their periods of energy in relation to seasonal sunlight. But a certain proportion of carbon-releasing life does actually pass like a great tide from Pole to Pole, in pursuit of the sun. Ornithologists need not be reminded of such birds as the knot or curlew sandpiper, breeding within the Arctic Circle, migrating to the Antarctic circle in autumn. There are the real migrants—the EU-MIGRANTS, to adopt a term already used in a somewhat different sense.

Yet these are not the only animals that move according to season, and a vast host of birds, mammals, fishes, and even insects ebb and flow each spring and autumn for distances that are to be measured in scores or in thousands of miles. We are apt to view the swallow or the cuckoo as the chief migrants. Really every bird in England (pheasant, grouse, rock-dove, sparrow, and one or two other exceptions are hardly worth mentioning) travels towards the north in spring and towards the south in autumn. Try to estimate the actual weight in tons of this equinoctial flood of highly organised flesh and blood. It must be reckoned, for our islands alone, in millions of tons. For example, in 1893 Professor A. Newton made an estimate of the number of puffins present at a single breeding station in the Hebrides. The result was 3,000,000 birds, a total of almost exactly one thousand tons. Add to this the many other puffin colonies, the great congregations of such breeding migrants as gulls, auks, plovers, or ducks; the total number of swallows, cuckoos, and other summer migrants, together with the millions of so-called "native" robins or thrushes. Should not the estimate in tons reach seven figures? Year by year, we note with sorrow, many of these migrants decrease in numbers. The old accounts of the hordes of wild fowl coming each spring to the marshlands of the Middle Ages are beyond belief to one who has not studied the changes in the face of England during the past few centuries. Man has all but exterminated the migrant whales and seals of our own seas; the bison as migrant has ceased to exist in

America. The mammoth, migrant of earlier days, died out for some reason unknown, although the event was doubtless connected with an alteration in the course or duration of the seasons in Europe.

The migrant is a specialised animal, and therefore in danger of extermination. Take, for example, the swallow, which lives only by wintering in Africa, yet owes its structure to the insects swarming in an English summer. If mankind progresses, all our country will be cultivated to the last possible inch. We shall by then, no doubt, have solved the problem of insect pests, and no plants will be allowed to become metamorphosed into the flies or beetles which form the support of insectivorous birds. What then will happen to the swallow? What will be the fate of a hundred species almost similarly placed? I find it difficult, under such circumstances, to foresee anything except sudden extermination.

In the fateful year of 1914 one date stands out as a warning to those who believe so fondly in the permanence of the human race, and I would like to discuss it in connection with migration and the fate of empires. The date was the first of September, for then, in the Cincinnati Zoo, died a female passenger pigeon (*Ectopistes migratorius*) which had passed the previous fourteen years in captivity. It was the last survivor of its race, and the species is now to be classed with the great auk, the dodo, and the pterodactyl. Within the memory of men still alive the passenger pigeon swarmed by the million in American woodlands. Alexander Wilson estimated a single flock to consist of 2,300,000,000 birds. In 1879 Brewster described a breeding colony in Michigan. It covered a stretch of forest thirty miles long by four broad, every tree holding some nests, many being filled with them. The birds arrived one spring day in a compact flock, five miles by one in extent; and from this colony, in that year, a single hunter managed to kill or capture some millions of pigeons. There were other great breeding grounds also, but to-day all are empty.

The passenger pigeon was alert, strong, swift of wing, fecund to a high degree. In a way it might have been viewed as the apotheosis of avian structure, safe, if any bird is safe, from the attacks of enemies. Many years ago, when the species was noticed to be diminishing in numbers, strict laws were passed both in the States and in Canada for its protection; and during the last twenty years government efforts were directed to the active preservation of the remnant of the flocks of past years. All was in vain. The passenger pigeon, in spite of its power, has slipped out of the life of the world—a sorry reward for its long and arduous duties as migrant.

For the migrant is essential to us, as necessary to our life as is solar energy or the green plant. Nature demands always a creature or a set of creatures which must undertake the work of swinging annually around the globe in the path of the sun. No reward; except, perhaps, the power of flight, or other means of locomotion. The rocks are full of the remains of flying pterodactyls, swift fishes, mammals endowed with endurance in travel, all beyond doubt the ordained migrants of past ages. And all are gone.

The bird, too, is going. We have already noted the disappearance

of the wildfowl of English marshes now turned into cornfields, and speculated on the fate of the swallow and its kind. What animal is ready to take the place of the bird? Without question this animal is man, already holding the second rank as migrant, and in the near future to exceed the labours of the bird. But, for the first time in the history of the world, migration is by proxy. We stay at home, leaving the transport of "bottled sunlight" to the ships which carry bread or beef from sunnier lands to be reduced to their elements in the crowded cities of Europe or America. The same laws which govern the balance of an aquarium, or the life of an Arctic marsh, apply to modern traffic in foodstuffs. Carbon is fixed in Australia or Canada, to be released in Europe, again carried by the tides of the atmosphere to be shared amongst the vegetation of the world.

It will be noticed that Canada is mentioned, and this suggests that migration need not, therefore, be north and south. In a simpler world, with one hemisphere dark while the other was light, the migratory current would be always northward in spring and southward in autumn. Differences in land area, in the annual hours of sunlight falling upon the two hemispheres, and other factors have all tended to divert the course of the migratory movement. It might be better, perhaps, to view migration as the periodic invasion of centres of bio-genetic intensity; but, as I show, the plants need not be eaten on the spot, and it is sufficient for the welfare of the life of the globe if they are reduced to their elements somewhere.

To me this problem of migration is an awe-inspiring phenomenon. I feel that I have not done justice to its importance, and can only trust that my remarks may lead others to approach the subject from the same direction. In the "Zoologist" for December, 1912 (4th series; vol. xvi., pp. 441-49), I attempted to crowd my ideas into a short paper. Shortly afterwards I came into possession of a pamphlet—*Leçon sur La Statique Chimique des Êtres Organisés*—by Dumas, which deals in a most lucid manner with the relations between plants and animals as a world force; and, I find, in 1844, a larger work on the same subject was published by Dumas and Boussingault. The latter I have not yet seen, but do not expect that migration entered the minds of these writers. I do not know of any English work which deals at all fully with the cosmic importance of the green plant, and some books on physiological botany dismiss the fact in a few words.* My acquaintance with the literature of migration is more extensive—an excellent bibliography, by the way, is appended to Mr. T. A. Coward's "Migration of Birds," Cambridge Manuals series—but I have not yet found any mention of the atmospheric connection between plants and migration. Several ornithologists have offered more or less tentative solutions of the problem, the simplest and best stating that migration is merely a matter of food. This explanation, of course, omits to consider the value of migration to life generally. My opportunities for extended study have been but slight during the past

* I find a note of a paper by C. Timiriazeff, entitled: "The Cosmical Function of the Green Plant," in the *Proc. Roy. Soc.*, No. 485 (1903-4), but I have not yet seen it. The title seems very interesting.

few years, and I need not mention the various works that I have read or re-read in the light of this theory of migration. Some have been bird books ; many were concerned with geology, astronomy (here to be mentioned Chap. xii. in Lubbock's "Pre-historic Times," with its discussion on the Precession of the Equinoxes), ethnology, trans-oceanic commerce, and so forth.

It is, I should think, easy to be wide of the truth in so ambitious a theory as that which I have sketched ; but, since 1912, I have searched in vain for any destructive set of observations, and would be glad to think that others were eager to discover the flaws in my reasoning.

REPORT ON THE BIRDS OF EPPING FOREST FOR 1918.

The Third Annual Report of the Committee of the Ornithological Section on the Birds of Epping Forest is appended. The prevailing war conditions have continued to restrict outdoor observational work and necessitate condensation in printing this report. To these conditions must also be attributed the lamentable delay in the preparation of this report, thereby unduly postponing the issue of this Volume of Transactions, which the Ornithological Committee greatly regret. Happily those conditions may now be expected to disappear gradually, and it is hoped more support may be received in the matter of records.

It has been decided to name another portion of the Forest which hitherto has presented difficulty in identifying for recording purposes, viz.:—*Warren Plain*. The area referred to lies between Warren Hill on the south, Strawberry Hill on the north, Warren Road and Paul's Nursery on the east, and Epping New Road on the west.

Members and friends are invited to send records and communications to the Secretary of the Committee, Mr. A. Brown, of 44, Ravensdale Road, Stamford Hill, N. 16.

January *2nd*.—Fieldfares, 20 to 30, at Oakhill, Hale End. *5th*.—Ring Doves frequent in Chingford Wood. Redwings between the Robin Hood and Warren House—very wild. *6th*.—Fieldfares still about Oak Hill. Redwings near Grimston's Oak and Epping New Road—wild and vocal. In Hill Wood, Chaffinches, Great and Marsh Tits feeding among leaves. *12th*.—Flock of Ringdoves, Fairmead. Most of the field-rose berries have now been eaten. *13th*,—Two Herons, Higham's Park Lake. A flock of a dozen Redwings basking in the sun on sheltered side of bushes in Fairmead (cold N.W. wind). They were feeding desultorily on the haws. Small flocks of Greenfinches, same place and at the Warren, feeding on hips. Several small flocks of Ringdoves about here and Long Hills. Greenfinches feeding on ground in Chingford Wood. Chaffinches and Tits were noticed to be in fine plumage. A dozen Jays seen during the morning. *19th*.—Ringdoves cooing in Chingford Wood. Great Spotted Woodpecker—apparently a pair prospecting in a tree with nesting hole. Drumming heard—also "chut" note. Five species of Tits seen about Ludgate Plain, and Tree Creeper near Cuckoo Brook. Robins singing. *20th*.—Redwings on Chingford Plain—not so wild as previously. Also a few seen in Fairmead, and 2 Meadow Pipits. Green Woodpecker "yaffling" by Warren House. Tree Creeper and Marsh Tit, Great Monk Wood, and the former again seen at Jack's Hill, Theydon. *21st*.—Male and female Barn Owls very noisy in the Sale, Higham's Park. *26th*.—Redwings in Chingford Wood by the Plain; Hen

Pheasant, Cuckoo Pits. A solitary Moorhen on Connaught Water—where they have been absent of late. *27th.*—6 Mallards on Connaught Water, and one Moorhen. Reed Bunting seen at High Beach. Two Bullfinches by Warren House. In the Alder Clump on Fairmead, 2 Tree Creepers seen; also a number of Blue Tits feeding on the catkins; also Marsh and Cole Tits. Green Woodpecker calling; Redbreasts in good song and Great Tit's "saw-sharpening" note. Song Thrush singing well in afternoon. 10 Jays noted.

February *2nd.*—Great Spotted Woodpecker watched at nesting site near Cuckoo Brook. It drummed 25 times, generally at regular intervals. There is a low "whinnying" noise when bird is about to alight. A party of 10 Jays in 2 elm trees in field by Ludgate Plain. Their behaviour was very curious and noisy. Finally the party scattered, leaving one behind screaming very excitedly. *3rd.*—Great Spotted Woodpecker again seen at same spot, apparently. Drumming heard. The "whinnying" note heard when one bird joined the other. Flock of Ringdoves at Cuckoo Pits cooing. Another pair of Great Spotted Woodpeckers observed beyond Blackbush Plain—"chut" note and drumming heard; also courting antics watched. Wings of hen pheasant found near Ludgate Plain. Sky Larks and Song Thrushes singing in Hawkwood. Missel Thrush singing well at 3 p.m. by Warren Pond. *9th.*—Marsh Tits in very fine plumage in Chingford Wood; a Heron flying over. Two Mallards on Connaught Water. *10th.*—Long Tailed and Cole Tits in round thicket. Party of 8 Goldfinches seen several times on Fairmead; one in song. Treecreeper in the alder clump. A large flock of Starlings were feeding here—also a flock of about 30 Ringdoves. A Blue Tit noted in splendid plumage. Redbreasts were either paired or mating, judging by their antics. Jackdaws with Starlings feeding on Chingford Plain. *16th.*—Blue, Great and Marsh Tits in Chingford Wood and at Ludgate Plain, Long Tailed Tits and Greenfinches; also the Treecreeper seen here twice. *17th.*—7 Tufted Ducks (males and females) and one Blackheaded Gull on the Lake in Wanstead Park. Lesser Redpolls on the alders by Higham's Park Lake. *23rd.*—Small flocks of Ringdoves in Chingford Wood. Song Thrush singing by Bury Wood and Hedgesparrow singing on Ludgate Plain. On Fairmead 2 Goldfinches seen, one singing. A Nuthatch was watched hammering something in an oak tree—it returned three times to the same spot. *24th.*—Song Thrush, Chaffinch and Hedgesparrow singing at Yardley Hill. A pair of Mallards flushed from the alder pond on Fairmead. Male Bullfinch singing at the same spot. Blue and Great Tits appear to have paired.

March *2nd.*—Five species of Tits noted in Chingford Wood and a Redwing on Fairmead. *3rd.*—Long Tailed Tits, Ludgate Plain, and a Treecreeper seen by the Red Path. *9th.*—In Chingford Wood parties of Chaffinches and Greenfinches feeding on ground. All species of Tits (5) noted near Ludgate Plain. An airship passing over Chingford Wood rather low down caused the Ringdoves to fly up, Tawny Owl flying and perching in the same place at 12.50 p.m. *10th.*—Five

Tufted Ducks—both sexes—on the lake, Wanstead Park. 3 male Bullfinches on Whitehall Plain and Yellow Bunting in song near same place. *16th.*—Greenfinches in fine condition in Chingford Wood uttering "cheering" note. Great Tit watched eating hornbeam seeds near Almshouse Plain, and Pied Wagtail noted same place. Two Great Spotted Woodpeckers watched in oak by Round Thicket—the "whinnying" note again heard when birds joined each other. *17th.*—Yellow Bunting still singing behind Bancroft's School. *18th.*—Song Thrush's nest, 4 eggs, Lord's Bushes. *19th.*—Kestrel seen, Fairmead. Two Mallards and male Pheasant, Jack's Hill. *22nd.*—Blackbird's nest, 4 eggs, Lord's Bushes. *24rd.*—Chiffchaff singing, Black Bushes. Greenfinch calling in Chingford Wood. 2 Treecreepers seen, Woodman's Glade, Great Spotted Woodpecker "drumming" and calling in Chingford Wood. *24th.*—A flock of a dozen Ringdoves in Bury Wood—Long Tailed Tit building nest, Yardley Hill. Yellow Bunting and Reed Bunting seen same place.

April *4th.*—Redstart singing in the Sale, Higham Park. *7th.*—Showery. Chingford Plain, eleven Jackdaws, one with prominent white feathers in each wing. Hawk Wood, Chaffinches and Great Tits calling, Robin and Wren singing; also two Chiffchaffs; Long-tailed, Blue and Marsh Tits, and a Hedge Sparrow seen, two Jays flushed and a green Woodpecker was heard yaffling. A Tawny Owl was seen. Two birds of prey, probably Sparrow Hawks, were observed near Hawksmouth Farm. On Yardley Hill, a Pied Wagtail, Reed Bunting and Yellow Bunting were noted; also some Goldfinches feeding on the thistle heads. Nests of the Long-tailed Tit and Thrush were found in the hedge. In Gilwell Lane, Greenfinches were seen and Wood Pigeons heard. Returning by Yardley Hill a green Woodpecker flew off, yaffling loudly, a Kestrel was noticed hovering and the song of the Willow Warbler heard. Several Carrion Crows were noted during the walk. *11th.*—Four young Thrushes in the Sale, Higham's Park. *13th.*—Very large gathering of Starlings on Chingford Plain, also flock of Ring Doves. *14th.*—Tawny Owls seen by Chingford Wood and two pellets found containing bones and hair of mouse (? species) and elytra of beetles. Hawk Wood, not much song, Willow Warbler and Chiffchaff noted. Two Tawny Owls flushed and pellets found. Bury Wood, about a dozen Wood Pigeons. Yardley Hill, male and female Bullfinches; Chingford Wood, many Greenfinches, two Missel Thrushes noticed. *20th.*—Chiffchaff's nest with 3 eggs in the Sale, Higham's Park. Cole Tit calling in Chingford Wood. *21st.*—Hawfinch's nest with 3 eggs in the Sale, Higham's Park. *22nd.*—Nightingale singing weakly in the Sale, Higham's Park. Swan sitting on 7 eggs, Higham's Park. *23rd.*—Kingfisher resting at Woodford. *24th.*—Red-backed Shrike's larder in Big Hale End, contents:—1 field mouse and 3 great water beetles. *25th.*—Wryneck by side of road between Wake Arms and Theydon Bois. (I have never seen him before in these parts though I knew him well in W. of England.—H.C.P.) *27th.*—Jay seen, Great Monk Wood. Willow Warbler singing freely in Chingford Wood and much other

song heard—thrushes, blackbirds, etc. To the north of the wood by Ludgate Plain, two Great Spotted Woodpeckers seen and heard drumming repeatedly and also uttering call note. A Tree Pipit singing and performing on Ludgate Plain. Male Pheasant calling in Black Bushes, and a Great Spotted Woodpecker heard here. Feathers of this species were picked up. Two Chiffchaffs singing in Round Thicket. Cuckoo heard calling in distance. Lesser Whitethroat and Tree Pipit seen and heard on Fairmead Plain. A male Mallard was flushed from the Alder Clump Pond on the Plain, but no nest could be found. In Hill Wood a Green Woodpecker "yaffling" and 2 Nuthatches seen and heard uttering two types of note; probably both sexes calling. Marsh Tit and a Redstart also noted at High Beach. Cole Tit and Willow Warbler at Loughton Camp. Male Redstart near Broad Strood. Lesser Whitethroat on Old Church Plain. In evening Ring Doves were coming into the wood to roost by Almshouse Plain. *28th.*—Swallows hawking over Yardley Hill, and Blackcaps and Lesser Whitethroat singing. Blackbirds nest with young in Gillwell Lane. Pied Wagtail at Sewardstonebury. Tawny Owl roosting in holly at the Cuckoo Pits. *30th.*—Wryneck seen by the bridge over Ching brook in Whitehall Road.

May *4th.*—Swallows and Sand Martins over Chingford Plain, Jay and Redstart Fairmead Bottom. Identified on walk from Chingford to Wake Arms by way of Magpie Hill, Strawberry Hill, Black Bushes, Little and Great Monk Woods—Cuckoo, Nightingale, Blackcap, Bullfinch, Wood Warbler, Chiffchaff, Willow Warbler, Whitethroat, Lesser Whitethroat, Tree Pipit, and Green Woodpecker. In Chingford Wood a number of Rooks in trees by edge of Plain. Male Redstart singing, Ludgate Plain. Wood Warbler singing by Cuckoo Brook, and another near Bury Road. Five Nightingales singing by Connaught Water. Green Woodpecker, "yaffled," and Great Spotted Woodpecker seen by Grimston's Oak. *5th.*—Long-tailed Tit nesting in Hawk Wood and Blackcap singing. Two Nightingales singing, also Common Whitethroat and Yellow Bunting on Yardley Hill. Swallows and House Martins over pond on Fairmead and Connaught Water. Blackcap singing, Chingford Wood, and Nightingale, Round Thicket. *8th.*—Nightingale singing near Connaught Water. *11th.*—Wood Warbler singing near Bancroft's School. Several Jays, Black Bushes. Several Jays and Redstarts, Fairmead Bottom. Swift, Chingford Plain. Male Redstart, Willow Warbler, Whitethroat, Blackcap, and Nightingale on Ludgate Plain. Great Spotted Woodpecker near Cuckoo Brook and again by Ludgate Plain. *12th.*—Jackdaws feeding on Chingford Plain. Heard and saw Garden Warbler by Red Path and heard 3 Nightingales. On Warren Plain saw a male Whinchat—had good views of the bird and heard the note (S.A.). A pair of Red-backed Shrikes in the same place, to the south of Strawberry Hill. A male Redstart seen and heard in Hill Wood. Several common and lesser Whitethroats heard during the week. Nightingales singing on Fairmead and Magpie Hill, 8 Carrion crows and 6 Jays seen. Tree Creepers seen in oaks opposite Chingford

Hotel. Swan sitting on nest, Warren Pond. Bubble note of Cuckoo heard, Ludgate Plain. Garden Warbler singing in Black Bushes and again on Fairmead Plain. Pied Wagtail at High Beach. *15th.*—Wood Warbler singing near Buckhurst Hill Church. *18th.*—Tawny Owl seen Honey Lane Quarters. *20th.*—Lapwing heard Rifle Range, Woodridden. *22nd.*—Four Wood Warblers singing near Wake Arms. Jackdaws and Rooks on Chingford Plain. Great Spotted Woodpecker seen and heard by Grimston's Oak. Green Woodpecker seen in Hill Wood—its movements appear to be more leisurely than the Great Spotted. Five Swifts flying over Bury Road. *25th.*—Turtle Dove and two Wood Warblers, Long Running. Moorhen and male Nightjar, Great Monk Wood. Three Wood Warblers singing near Wake Arms. Starlings and Sparrows busy feeding on the great quantity of larvæ now about the woods. *26th.*—Rooks and Jackdaws on top of tree near Ludgate Plain, feeding on larvæ (?). Turtle Dove near Blackbush Plain. Wood Warbler between High Beach Church and Hill Wood. During the month a pair of Lesser Redpolls were repeatedly seen at Woodford, where they were most probably nesting, although the nest was not located.

June *1st.*—Long Running, two Wood Warblers, several Jays, and two Nightjars, male and female. Great Monk Wood, Lesser Redpoll heard. Broad Strood, Blackcap heard. *2nd.*—Numbers of Rooks and Jackdaws in Chingford Wood. Blackcap, Garden Warbler, and Nightingale heard on Ludgate Plain. Mallard and 7 young on neighbouring pond. *7th.*—Fine evening. Several Skylarks singing on Chingford Plain, 8.10 p.m. Great numbers of Starlings in Chingford Wood, apparently feeding on the quantities of larvæ—the trees being badly defoliated. They looked like birds of the year. Five Nightingales heard in the neighbourhood of the lake. Also one Lesser and several Common Whitethroat. A Garden Warbler heard. Cuckoo heard repeatedly, also Ring Dove. Larks still singing at 9·45 on the Plain. *8th.*—Great Monk Wood, young Willow Warblers, Whitethroats, male Pheasant, Tree Pipit, Lesser Redpoll heard; Nightjar's egg found; it was gone next week. Long Running, two Green Woodpeckers. Young Great Tits being fed opposite Chingford Hotel. Swarms of young Starlings on Whitehall Plain. Bubble note of Cuckoo, Chigwell Row Recreation Ground, and Pied Wagtail same place. Tree Pipit, Common Whitethroat, Turtle Dove, and Yellow Bunting singing in Hainault Forest. *9th.*—Male Redstart singing by Grimston's Oak, and swarms of Starlings. Flocks of Jackdaws and Rooks at High Beach. *15th.*—Fine and sunny. Flocks of Rooks and Jackdaws feeding on Chingford Plain. Larks in song. Between Connaught Water and Warren House both Whitethroats heard, and a party of young Cole Tits with parents seen, and Nightingale in good song. Willow Warbler feeding young on Warren Hill. On Warren Plain a Yellow Bunting singing, also 2 Tree Pipits singing and performing. A male Red-backed Shrike seen chasing a Jay, and the scolding note of Nightingale heard. At Strawberry Hill heard Lesser Whitethroat and Nightingale. A family of young Blue Tits in Old

Church Plain. In Ludgate Plain, Nightingale, Garden Warbler, and Whitethroat singing. Inspected nest of Great Spotted Woodpecker near Ludgate Plain, and watched the young bird repeatedly put its head out of the hole—showing the large red patch on crown. The parent birds heard but not seen. Heard Turtle and Ring Doves. Cuckoo calling. Large numbers of Starlings feeding in the oak trees by Connaught Lake. Three Jays were seen, but all were quite silent. *16th.*—On edge of Chingford Plain Jay chased young bird, which seemed to have white feathers in wing, probably chaffinch. Young bird settled in tree, and either then or just after was captured by Jay, which settled on ground, and shook and battered it; went off with it in beak, apparently dead. Small birds much agitated; male Blackcap appeared on bush. Spent an hour at Woodpecker's nesting hole by Ludgate Plain, youngster showed himself frequently, and parent bird (or birds) thrice settled on trunk of tree, but went off without feeding him. Showers came on and Tree-creeper took refuge on sheltered side of an oak where it remained motionless (J.R.). *22nd.*—Great Monk Wood, Carrion Crow, several Redstarts, Tree Pipit. Broad Strood, Reed Bunting heard. Broomhill, Bullfinch heard. Very breezy. Few Starlings about. Wren singing. Family of Hawfinches feeding on tops of oaks, evidently getting larvæ, not far from Connaught Water. Redstarts with youngsters near Cuckoo Brook. *29th.*—Great Monk Wood, Carrion Crow, Tree Pipit, several Redstarts. Long Running, Wood Warbler heard. Broad Strood, Blackcap heard. *30th.*—Cuckoo heard and Redstart's note frequent near Cuckoo Brook.

July *4th.*—At Warren Hill, a pair of Red-backed Shrikes seen and Yellow Bunting in song. Debden Slade male Red-backed Shrike seen. *6th.*—Great Monk Wood, saw Great Spotted Woodpecker, Nightjar, Tree Pipit, Carrion Crow, Linnet. Heard Whitethroat, Chiffchaff, Jay, Yellow Bunting. *9th.*—Tit notes and calls more plentiful than for some time in Chingford Wood, both Great and Blue searching oak trunks, had not been seen doing this since the larva plague began. Blackcap in good song. Wren song frequent. Yellowhammers singing on heath near Wake Arms. *13th.*—Low call of Chiffchaff heard at Cuckoo Pits—continued for some time. Also Garden Warbler singing at same place. *21st.*—Moorhens seen on Cuckoo Pit Ponds. *22nd.*—On Chingford Plain flocks of Rooks and Jackdaws, with heads to wind, which was very high. Swifts and Sand Martins flying over Strawberry Hill. Common Whitethroat and Tree Pipit singing. At the Cuckoo Pits a Tawny Owl seen. *28th.*—Great Spotted Woodpecker, two heard near Fairmead, one seen in flight. Heard again, Hill Wood, where Jays were numerous and more noisy than they have been for some time.

August *4th.*—Fine morning. By Connaught Water two Redstarts seen, one adult female and one young bird. Between the Lake and the Warren, saw one adult and one young Nightingale. Heard Turtle Dove. Watched Marsh Tit devouring eggs (?lepidopterous) deposited on a twig. On Warren Plain a flock of Starlings feeding and a

family of Red-Backed Shrikes—two adult and three young birds. Flushed a covey of Partridges—six or seven birds. By the Red Path, saw a young Red-Backed Shrike. Several Redstarts by Buttonseed Corner and Magpie Hill—mostly young birds. Swallows and House Martins hawking over Chingford Plain. Willow Warblers still singing. *25th.*—Warm and sunny. Forest very silent. Saw Whitethroat, Great and Blue Tits, House Martins. Heard alarm notes of Wren and Redstart. During the month a pair of Magpies were observed upon two occasions near the Owl Inn, Leppits Hill.

September *8th.*—Very wet and windy. Hawk Wood, large party of Great Tits, no other species with them. Chingford Plain, three Sand Martins and plenty of Swallows. Bury Wood, Wren. Gilwell Lane, nine Blackbirds flew across, flushed covey of eight partridges, and the noise they made started a Tawny Owl hooting, noon. Bury Wood, Kestrel hovering, Jay heard. *22nd.*—Kestrel hovering over the Warren. *29th.*—A Redbreast sat so near that the white round the eye could be seen, and also that the red of the breast extended round the beak.

October *5th.*—Treecreeper, Cuckoo Pits. Swallows and Martins, Ranger's Road and Warren Pond. *6th.*—Moorhens, Connaught Water. Swallows and Martins, Fairmead. Male Wheatear, also near Fairmead. *13th.*—Long-tailed Tits, Ludgate Plain and near Fairmead. *20th.*—Dull and drizzling. Tawny Owl flying near Warren House and another heard calling in Debden Slade. Large flock of Ringdoves, estimated at 100, over Strawberry Hill. Flock of 20 Fieldfares flying over Warren Plain. Eight gulls flying east over Connaught Water—appeared to be Black-headed gulls. Redbreasts singing; also Chaffinches. A Cole Tit heard at Strawberry Hill. *26th.*—Redbreasts in good song. Several Missel Thrushes seen and heard singing—Nursery Road, Loughton.

November *2nd.*—Great and Blue Tits much more lively in Chingford Wood. A Marsh Tit noted. *9th.*—A flock of about 30 Lesser Redpolls observed in the Birches near Wake Arms. *23rd.*—Song Thrushes commencing to sing, Chingford Plain. Green Woodpecker seen and heard Yardley Hill. *24th.*—Song Thrushes singing, Whitehall Plain, and Redwings numerous there. Two Swans on the Ching Brook, same place. A Tree-creeper seen. *30th.*—Redwings still about Whitehall Plain. A Bullfinch identified, same place. During the month Great Spotted Woodpecker seen and heard in Wanstead Park.

December *1st.*—Mild, misty and drizzling. A male Pochard on Connaught Water, also 5 male Mallards and 5 female Duck (? species), one Moorhen. On Warren Plain 2 or 3 hundred Redwings—very wild and singing a great deal. Saw male Hawfinch, also a number of Starlings. *7th.*—Party of Goldfinches Yardley Hill. Tree-creeper, Long-tailed, Coal, Blue, and Great Tits, Gilwell Lane. *21st.*—Red-

wing at Whitehall Plain and round Connaught Water. Finches (? species) feeding on hornbeam seeds which they took from the trees and split in their beaks. *26th.*—Dry and fresh. Near King's Oak, High Beach, number of Rooks were assembling at 4 p.m., the birds arriving from several directions. They have been noted at the same place before. *29th.*—Dull, mild, high west wind. A Missel Thrush singing by the Warren Pond. A party of Long-tailed Tits by Connaught Water. Number of Redwing on the thorn berries, Warren Plain—very wild—also 2 Reed Buntings seen here. Male Goldfinch near Warren House.

Wanstead Park Heronry.—Mr. F. F. Mackenzie reports as follows:—I don't think there was anything special about the Heronry in Wanstead Park during the year 1918. The Herons seemed much the same as usual and the nests counted numbered 56.

OBITUARY NOTICES.

Charles Smith Nicholson.

The Society has suffered a great loss by the death of C. S. Nicholson, who passed away on Armistice day, November, 1918. For many years he has been an enthusiastic supporter of the Society, and his wide knowledge of plants has always been placed freely at the service of any who desired help in the determination of critical species. His untiring efforts as recorder of the flowering plants of the district is a permanent asset to the work of the Society. From time to time he presented the Society with numerous specimens for the herbarium.

By his will he leaves to the Society a considerable number of valuable botanical and ornithological books, a large collection of birds' eggs contained in three cabinets, also a very fine collection of dried plants in a large cabinet. These plants are nearly all of his own collecting, and their quality shows a knowledge and care in collecting and preserving that has not often been equalled. As a keen botanist, a generous supporter of the Society, and, to many, a friend who can never be replaced, C. S. Nicholson will always be remembered.

David MacIntosh.

David MacIntosh joined the Society at the formation of the Woodford Branch, and although one of the youngest members, showed a keen interest in its different activities, especially in recording the flora of the Forest area and in the subject of rock gardening.

At the commencement of the war he did splendid work in the Scouts Defence Corps, gaining a special certificate of appreciation from General Baden-Powell for his work.

Later, he joined the Essex Regiment as a private, and was killed in action on August 8th, 1918, the first day of the Somme offensive, at the age of 19.

His death has been a great loss to the Society, and the deep sympathy of its members will go out to his family in its bereavement.

George Brooks.

George Brooks died after a short illness brought on by exposure on the occasion of his final Army medical examination on February 2nd, 1918. By his death the entomological world has lost an ardent worker of the modern school of entomologists. He spent many holidays at Wicken Fen, on which he became almost an authority, and claimed to have discovered the "home" of *Tapinostola hellmanni*, of which species he made a special study in regard to its time of flight and other habits. Latterly he did good work in the Surrey districts, and at our meetings showed many specimens captured around Horsley. Those who knew him intimately can testify to his unselfish character and geniality. He was a delightful entomological companion, always ready with a witty remerk, and will be greatly missed by his many friends.

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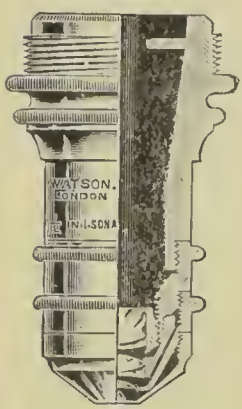

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Meetings are held on the First and Third Tuesdays in each month, in Hall 20, Salisbury House, Finsbury Circus, E.C. The meeting room is open from 6.30 p.m. to 9.30 p.m., and meetings commence at 6.30 p.m. punctually, unless other arrangements are announced.

The **Chingford Local Branch** meets at the Assembly Hall, opposite Chingford Station, at 8 p.m., on the First Monday in each month.

At these meetings specimens in various branches of Natural History are exhibited, and papers on various subjects are read and discussed. Visitors are cordially welcomed on the introduction of a member of the Society.

The Minimum Annual Subscription for Members is 5s., and for Associates 2s. 6d. Members paying a Subscription of 7s. 6d. receive two copies of the Transactions free; other Members can purchase the Transactions at half the published price. All Subscriptions become due on January 1st. Members elected after June 30th pay not less than 2s. 6d. for the year of their election.

New Members and Associates pay an entrance fee of 2s. 6d.

The Subscription is fixed at as moderate a sum as is possible, consistent with the proper maintenance of the Society and its work, in order that all may avail themselves of the benefits offered. The Society therefore looks with confidence for the support of all who are interested in the study of Natural History.

Further information may be obtained from the Secretary.

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